

Appendix C: Early Action Plan (2001)

Purpose

The purpose of this document is to provide recommendations to the responsible agencies on several strategies for managing Island County's water resources while a more detailed Watershed Management Plan is being prepared. The recommendations are based on existing information and basic analyses. The recommendations are limited to actions agencies can take readily, without changes to law or policy. The period these recommendations cover is expected to be about four years. The final Watershed Management Plan will be based on more detailed analysis and will likely contain policy and regulatory changes.

The recommendations are made by the Island County Water Resources Advisory Committee / Watershed Planning Unit. The Water Resources Advisory Committee (WRAC) is chartered with advising the County Commissioners and government agencies on water resource management and with preparing a watershed management plan under the state Watershed Management Act (RCW 90.82). The Advisory Committee is comprised of citizens appointed by the county commissioners who reflect diverse interests and areas of Whidbey and Camano Island. The Watershed Planning Unit includes the WRAC along with the three cities of Langley, Coupeville, and Oak Harbor, the Island County, and the Department of Ecology. Including the agencies responsible for water resource management ensures that the early action recommendations are feasible and achievable.

Recommendation 1

The Department of Ecology should continue to process water rights in Island County while a Watershed Management Plan is being developed.

Island County is experiencing rapid growth. With the growth comes a need for safe, clean, reliable water to support the increased population. Figure 1 compares Island County's Growth over the last decade with the estimated number of people served by new water rights issued over the same period of time. As shown in Figure 1, the Department of Ecology, due to resource limitations, has not been able to process water right applications at pace with the growth.

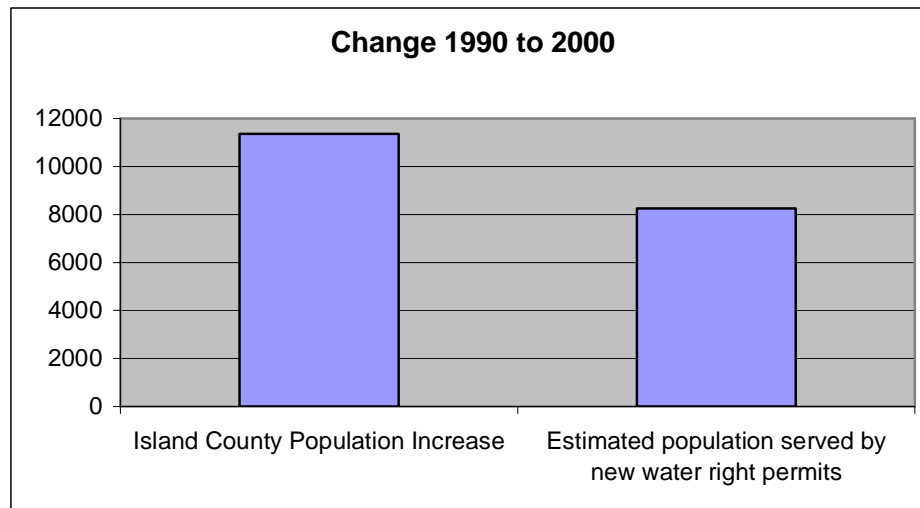
As a result, there is a backlog of applications and the development of new sources of water requiring permits has been greatly limited. In Island County this has lead to a proliferation of small water systems that are exempt from having to obtain water rights through the permitting process. These smaller systems, while appropriate in some situations, may not be appropriate in areas where dense development occurs or is planned or in areas where the resource may be limited. The results are twofold. First, water supply development has occurred that is not consistent with the Island County growth policies of promoting in-fill development and directing growth towards areas of more intensive development. Second, water supply development may be occurring in areas where the water resource is limited.

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Through continued careful processing of water rights in Island County, this conflict can be kept at a minimum.

Figure 1- Pop. Increase and Pop. Served by New Water Rights



Sources:

United States Census 2000,

Department of Ecology Water Rights Tracking System,

Office of Financial Management – Research Brief 10, August 2000

Recommendation 2

The Department of Ecology should focus water rights processing in two areas. First, in the area which contains the oldest pending applicant for a water right. Second, in areas where water is available and growth will occur.

The Department of Ecology has the ability to prioritize its water right application work load between water sources based on a number of criteria, including age of applications, water quantity, support of local planning, and other important factors (Washington Administrative Code 173-152-030). Over the last few years Ecology, in consultation with the Island County Health Department, has focussed its water right permitting in the Coupeville and Camano Island areas. Those areas are nearly complete. Once completed, Ecology should turn its efforts to the water source that contains the oldest permit application. At the same time, Ecology should also devote effort to the area where water is most available, there is a low risk of seawater intrusion, and growth is expected or planned to occur.

In order to make specific recommendations on areas, the Water Resources Advisory Committee / Planning Unit divided Island County in to 33 study areas. Each study area is analyzed for age of oldest application, water availability, land use planning, and seawater intrusion. The study area boundaries were delineated based on estimated approximate divides in the groundwater flow regime (see Map 1). In general, it is assumed that water withdrawn in one study area would have little, if any effect on the other study areas. These

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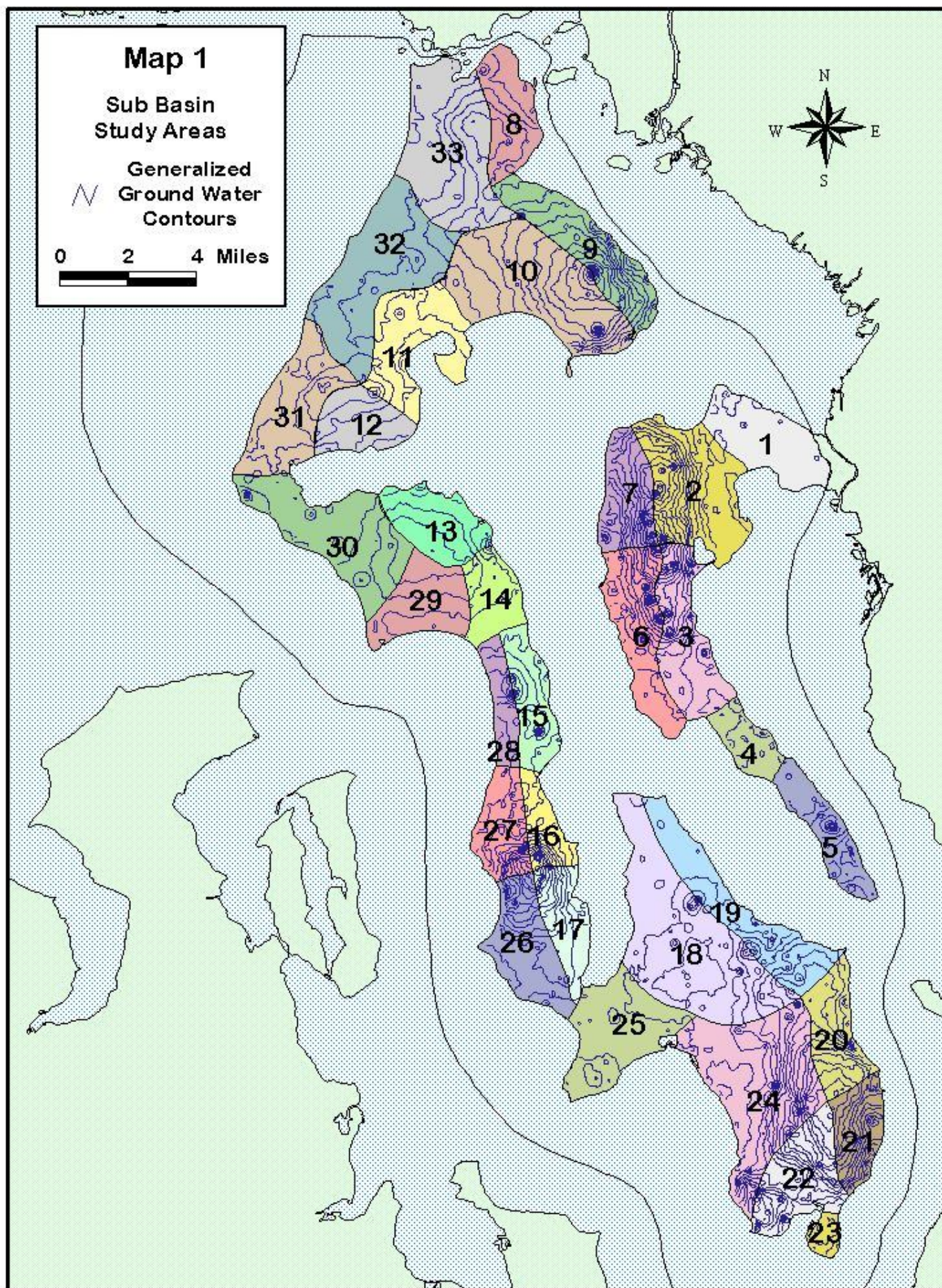
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study areas approximate water sources between which Ecology may prioritize water right processing. Actual sources will need to be determined by the Department of Ecology based on case-specific analysis.

Map 2 shows the results of the analysis based on age of application. The oldest application, once the Coupeville area is completed, is in study area 32. This is one area where Ecology should focus part of its water right processing effort. Map 3 and Table 1 show combined results of the other factors. This shows that Ecology should also focus part of its water rights processing effort in the South Whidbey area where nearly all of the highest ranking study areas are located once the Coupeville area and Camano Island are complete (for example study areas 20, 21, 17, 24, 19, 22, and 18 in rank order). The Early Action Plan Appendix (at end of Appendix C) contains more detail on the analysis.

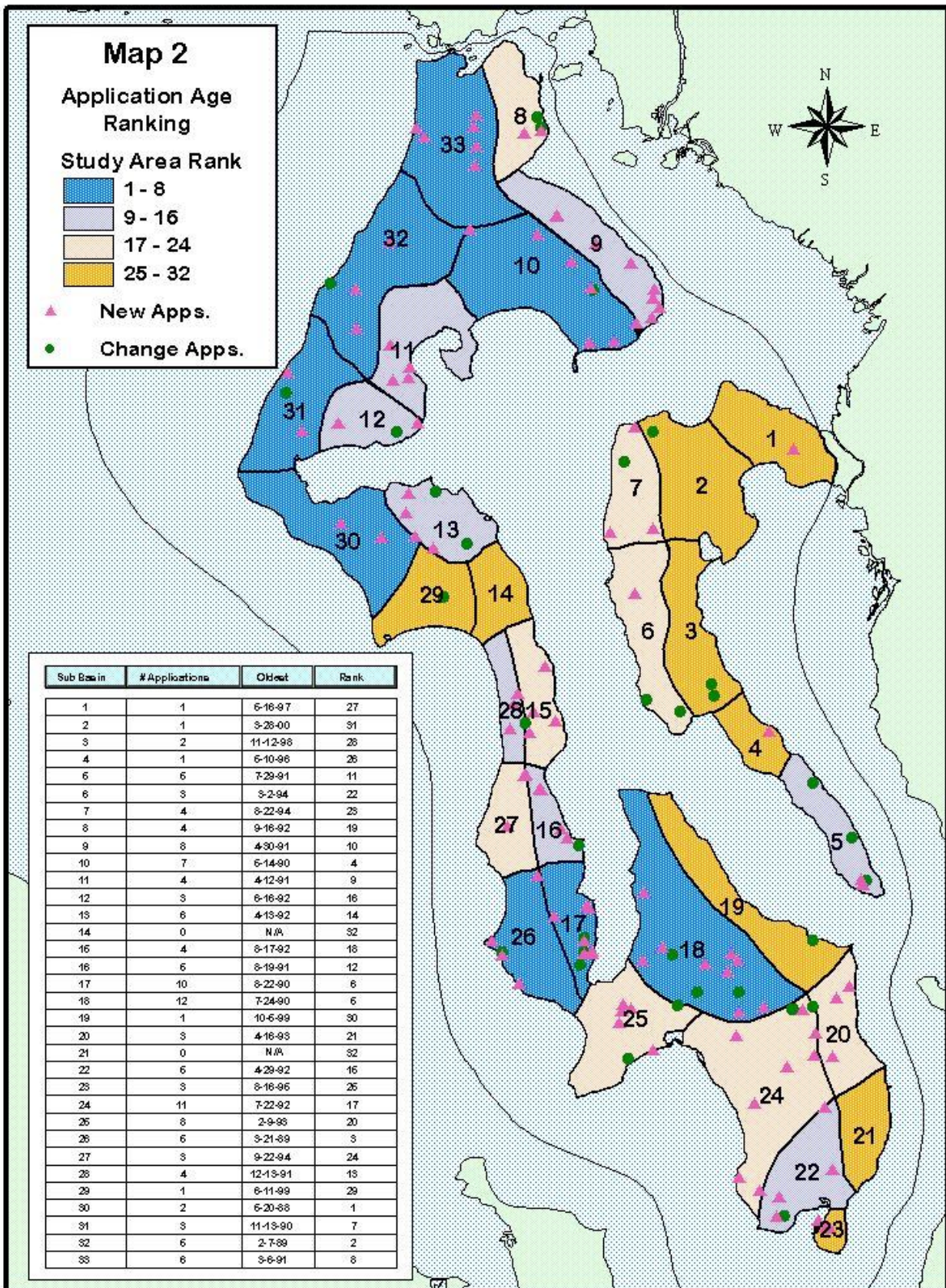
Table 1 – Summary Ranking of Study Area Analysis

Study Area	Agriculture Rank	Parcel Rank	RAID Rank	Chloride Rank	Quantity Rank	GW Elv. Rank	Total Score	Total Rank
1	5	26	17	26	28	32	134	31
2	12	15	2	10	25	8	72	9
3	12	6	1	12	14	9	54	3
4	12	3	25	25	4	33	102	21
5	12	7	27	21	2	30	99	19
6	12	13	4	14	8	10	61	4
7	12	5	27	9	15	6	74	10
8	12	25	19	19	23	14	112	26
9	5	28	22	17	17	5	94	16
10	1	31	20	18	30	4	104	23
11	5	32	27	28	33	25	150	33
12	12	18	8	31	32	24	125	29
13	1	22	12	22	24	19	100	20
14	12	9	21	30	9	29	110	25
15	12	8	15	24	1	23	83	12
16	12	14	26	13	26	16	107	24
17	12	4	3	7	27	11	64	5
18	5	21	18	6	5	26	81	11
19	12	20	6	3	10	17	68	7
20	12	16	7	1	11	2	49	1
21	12	11	11	2	13	1	50	2
22	5	24	27	5	7	3	71	8
23	12	1	27	8	18	18	84	13
24	1	27	5	4	20	7	64	5
25	5	10	14	15	21	31	96	18
26	12	19	23	16	12	12	94	16
27	12	17	27	11	6	13	86	14
28	12	2	9	23	22	21	89	15
29	12	23	13	29	3	22	102	21
30	5	29	10	33	19	28	124	28
31	12	12	16	32	29	27	128	30
32	1	33	27	27	31	20	139	32
33	12	30	24	20	16	15	117	27



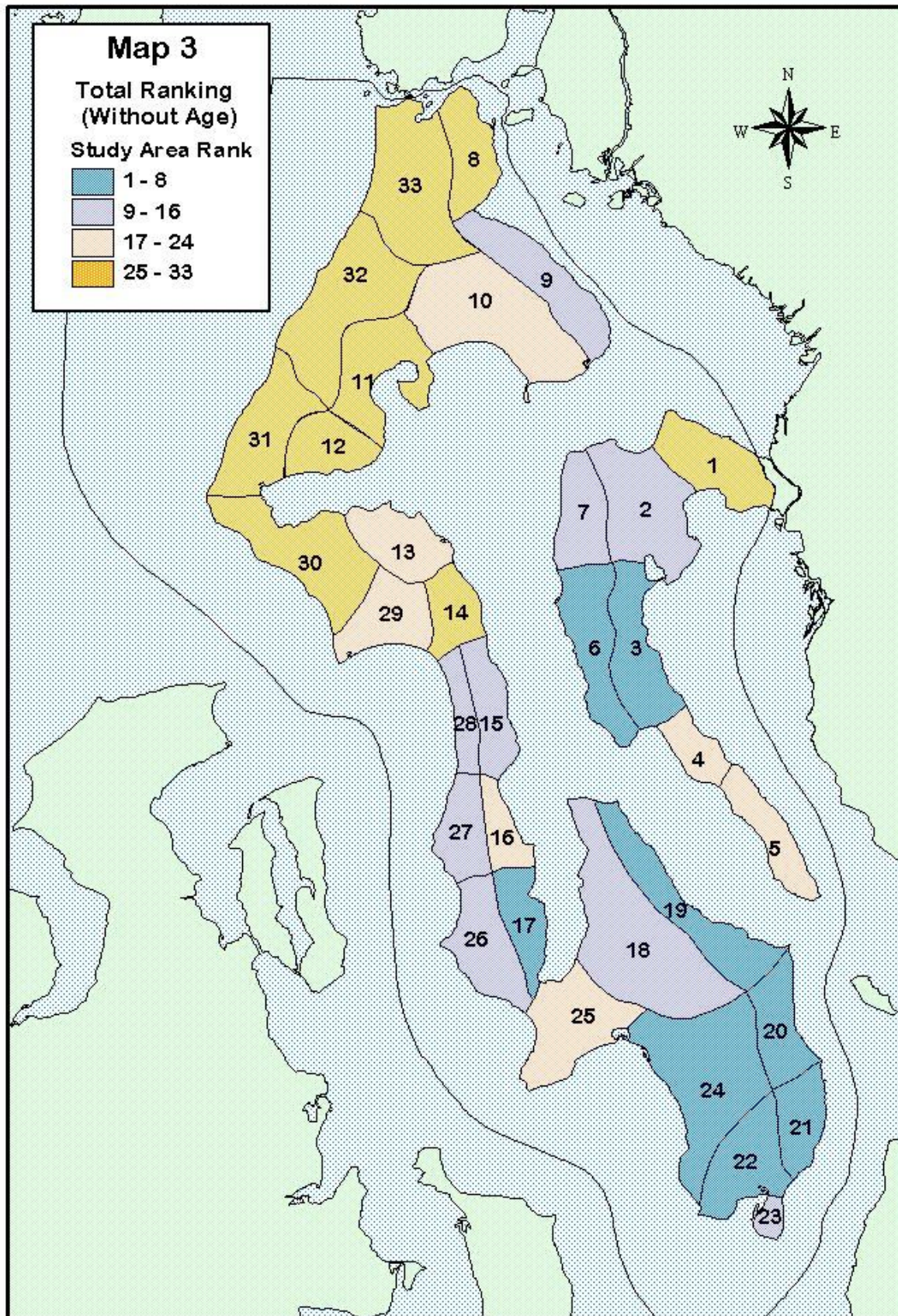
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Recommendation 3

Island County should form a Conservancy Board to aid in reducing the backlog of water rights permits.

Recent state legislation (Chapter 90.80 RCW) allows counties to form Conservancy Boards for the purpose of reviewing water right change applications. Any water right changes the board processes reduces the backlog that Ecology must process. The board is made up of three commissioner-appointed board members. The Department of Ecology reviews all decisions of the conservancy board.

Furthermore, the Conservancy Board and Ecology should coordinate their efforts at processing water right change applications to ensure that the work is done efficiently.

Table 2 shows the number of total water rights applications and the number of change applications. Map 2 shows the distribution of both new applications and change applications. There is anecdotal evidence that there may be an additional latent demand for water right changes that will appear once the pace of processing change applications increases.

Table 2 - Island County Water Right Application Backlog		
	Total Water Right Applications	105
	Change Applications (eligible for Conservancy Board Review)	33
Source: Department of Ecology Water Rights Tracking System		

Recommendation 4

Island County water right applicants should pursue cost reimbursement when possible

Recent state legislation (Revised Code of Washington 90.03.265) allows for water right applicants to pay for an Ecology-approved consultant to process their water right application rather than wait for Ecology to work through the backlog to their application. The applicants must also pay for all senior applications in the same source of water supply. There is an opportunity for applicants or groups of applicants working together to expedite processing of water rights. In many cases, based on the distribution of water right applications and the nature of Island County's groundwater, this should be a manageable strategy. Sources may likely be delineated at a scale similar to the study areas used in this analysis. Map 2 shows the distribution of water right applications. Any water rights processed through cost reimbursement will reduce the backlog that Ecology must work on.

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Recommendation 5

Extra care should be taken when reviewing water withdrawals near current or potential salmon bearing streams.

The recent listings of some Puget Sound salmon species as threatened or endangered under the Endangered Species Act place any actions that may harm salmon under scrutiny. Current studies suggest few, if any threatened or endangered salmon use Island County streams. Nevertheless, it is known that groundwater withdrawals can impact stream flows. These impacts should be minimized to protect fish, wildlife, aesthetics, and recreational opportunities, whether or not there are endangered species present. The Department of Ecology (along with a conservancy board if formed and consultants working under cost reimbursement) should review applicable information on salmon and other fish species distribution and the potential impact to surface water when reviewing water right applications. Table 3 shows fish bearing and potential fish bearing streams in Island County. Map 4 shows the distribution of fish bearing streams. Similarly the County Health Department should consider information on salmon distribution when reviewing building applications for water availability.

Table 3 – Island County Fish Bearing Streams

Known fish supporting (Salmon & Cutthroat Trout) with existing migratory salmon species

1. Maxwellton Creek (108)
2. Glendale Creek (119)
3. Chapman Creek (35)

Known fish supporting (Cutthroat Trout) with the potential for restoring migratory salmon species

High potential

4. Cultus Creek (118)
5. North Bluff Creek (45)
6. Dugulla Creek (7)

Low potential

7. Cavelero Creek (32)
8. Deer Creek (117)
9. Brookhaven Creek (100)

Cutthroat Trout Creeks without potential for restoration of salmon

10. Old Clinton Creek (116)

Identified potential fish supporting creeks that have the habitat for the restoration of migratory salmon species

High potential

11. Swantown Creek (13)
12. Crescent Creek (11)
13. Kristoferson Creek (26)
14. Lone Creek (99)

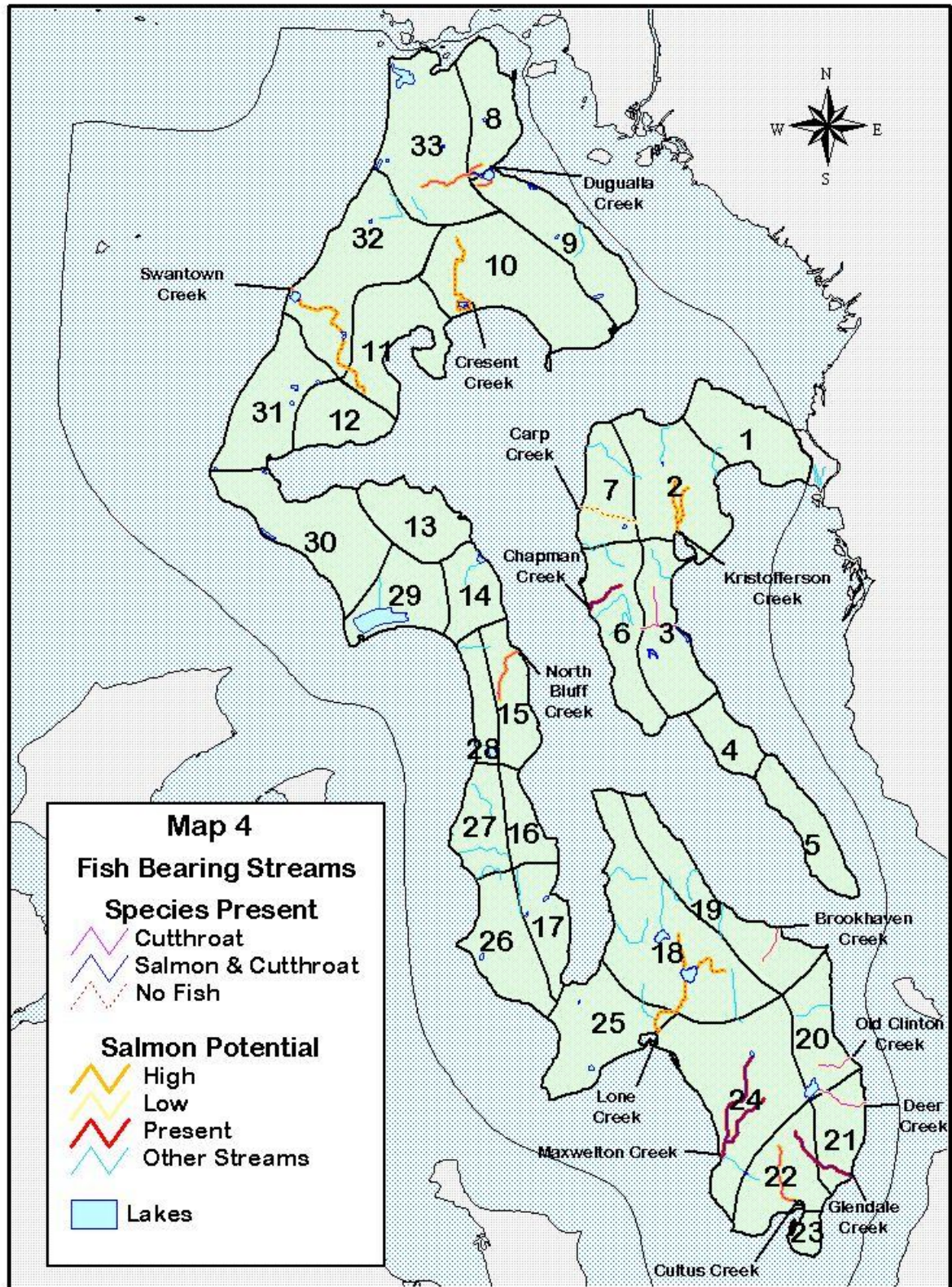
Low/Moderate potential

15. Carp Creek (28)

Source: Island County Public Works Department

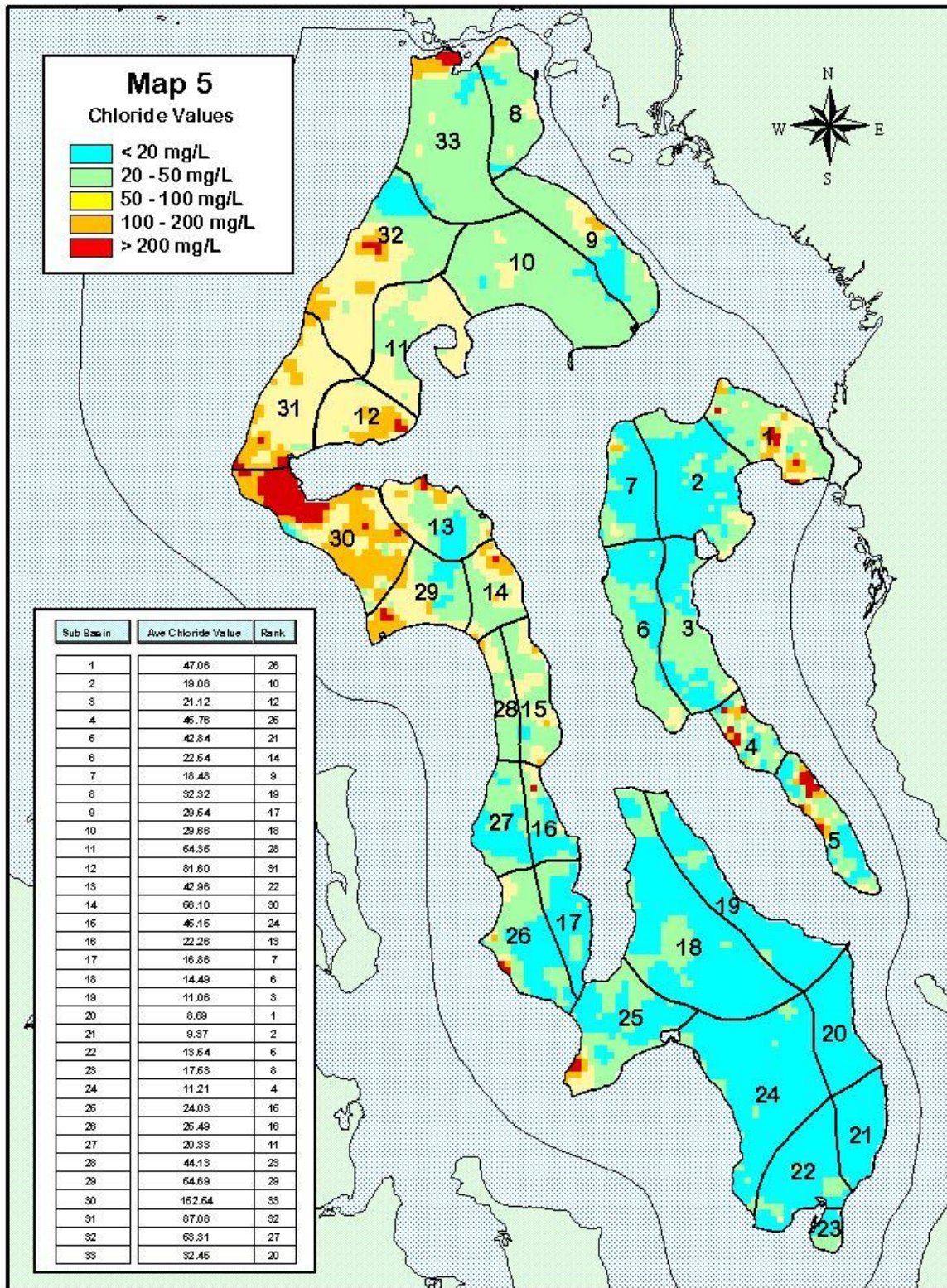
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Recommendation 6

Increased water usage by public water systems in areas of seawater intrusion should be addressed in a consistent and coordinated manner.

In some areas in Island County, increased water use by public water systems can cause or contribute to seawater intrusion. The state Department of Health regulates public water systems that have over 15 connections. The County Health Department regulates smaller systems. The Department of Ecology is responsible for preventing degradation of ground water quality to ensure that existing and future beneficial uses are maintained. Ecology is also responsible for ensuring that growing systems operating under a permit issued by Ecology do not impair senior water rights. The state Department of Health and the Island County Health Department should work with Ecology to address increases in water usage within areas exhibiting seawater intrusion in a consistent manner. Map 5 shows estimated chloride concentrations in groundwater. Areas in the county that have been intruded by seawater are represented on the map by chloride values in excess of 100 mg/L, although some of the elevated chlorides may be related to hard ground water rather than seawater intrusion.

Conclusion

The Water Resources Advisory Committee / Island County Planning Unit urges the agencies responsible for water management in Island County to follow the recommendations above to the extent their authority and resources allow. The recommendations are small steps toward improving water resource management in the near term. The collaboration of the agencies in developing this set of recommendations demonstrates these are also achievable steps.

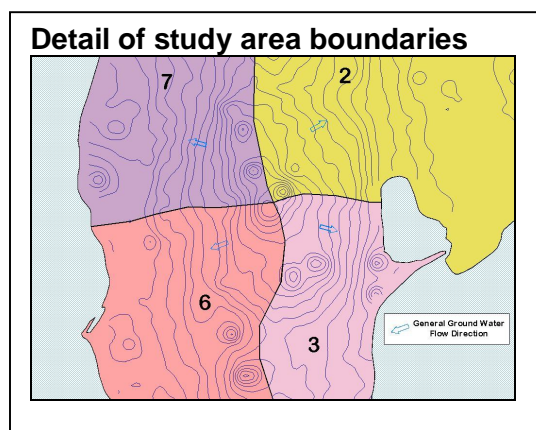
Early Action Plan Appendix – Study Area Analysis

Study Area Delineation

The analysis in this Early Action Plan is based on comparing sections of the islands against one another. These sections, called study areas, are delineated for the purpose prioritizing the order in which water right applications are processed. The study areas are based on estimated approximate divides in the groundwater flow regime (see Map 1). In general, it is assumed that water withdrawn in one study area would have little, if any effect on the other study areas. Thus, these study areas may be used to approximate water sources.

Methodology

Study area boundaries were delineated in two steps. First a contour map of groundwater surface elevation in the most utilized aquifers was produced using water level information on 1789 wells. These wells were selected because of relatively accurate locational information and a screened depth within 100 feet of the most utilized aquifers (the depth at which the majority of wells within any given area are drilled).



Second, study area boundary lines were drawn along the groundwater level contours similar to the delineation of watershed basins. Boundaries generally follow ridgelines in the contours (see detail). In general groundwater will flow away from high points or ridgelines and towards the edges of the islands.

Limitations

The study area boundaries have two important limitations. First, the study area boundary lines are based on approximations of groundwater characteristics. As with all study of groundwater, estimates must be made based on limited information. Well locations and water level elevations from which the contours were estimated are often not precise. The distribution of selected wells is not uniform and thus some of the contours are based on limited data points. The estimated topographical features of the groundwater level, from which the boundary lines are drawn, are expected to be close to the actual topography, but they are not precise.

Second, groundwater is not fully independent across the study area boundaries. In general, effects in one study area may have little influence on another. However, as the boundary lines are approached, the independence diminishes. For example, a withdrawal of groundwater in the center of one study area will likely not affect the groundwater in an

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adjacent study area. On the other hand, a withdrawal near the boundary of a study area may affect groundwater across the boundary.

Because the ground water contours illustrate approximate ground water flow in the most utilized aquifer, ground water flow in relatively shallow or deep aquifers could be substantially different than that shown in Map 1.

Water Availability

This is an estimate of relative water availability between study areas (Map 6). It is expressed as the percentage of annual groundwater recharge that is currently being used for domestic, agricultural, industrial and other purposes. Groundwater recharge is that portion of precipitation that infiltrates the ground and replenishes the groundwater. Infiltration is typically much less than rainfall because precipitation may also run off the island as surface water, evaporate, or be taken up through plant life. Virtually all of Island County's drinking water is replenished from groundwater recharge.

These estimates can be used to compare study areas against one another and determine where there is greater potential for future water supply development. A low percentage means that a small proportion of the estimated recharge in a study area is currently being used, and it may suggest more water is available. A high percentage means that a high proportion of the estimated recharge is being used, and it may suggest little additional water is available.

These estimates cannot be used to definitively answer how much water is available or whether new water uses can be developed for several reasons. First, Island County's groundwater system is complex. Actual water availability will vary based on location and depth of a well. Second, not all groundwater recharge is available for human uses. Some recharge must move through the groundwater system to prevent seawater from intruding into the groundwater. Some recharge also provides water for streams, lakes, and wetlands. Finally, the numbers presented here are only estimates. There is a great deal of uncertainty around the accuracy of the estimates (see limitations below). Further studies are being conducted to improve these estimates in the future.

Methodology

These estimates are made from three elements described below:

Estimated domestic use – This is calculated from the Census 2000 population counts multiplied by a per capita use factor. Population for each study area is estimated from the census blocks that most closely correspond with the study area. The population in the Oak Harbor city limits and the Whidbey Island Naval Base are subtracted from these estimates because they derive their water from an off-island source (Anacortes / Skagit River). The per capita use factor is 100-gallons/day, this value is taken from the Island County Coordinated Water System Plan.

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Estimated other uses – This is derived from the Department of Ecology's Water Rights Database. The reported annual quantity held as a water right for non-domestic or largely non-domestic uses, such as irrigation, is totaled for each study area.

Groundwater Recharge – Groundwater Recharge estimates are taken from the Island County Groundwater Management Plan. Each study area is assigned the recharge rates from the most closely corresponding recharge sub area from the Management Plan. The Management Plan provides a high and a low estimate in inches/year. These estimates are averaged and multiplied by the area in each study area to produce an estimate of total recharge in acre feet/year.

Limitations

Each of the categories above has limitations.

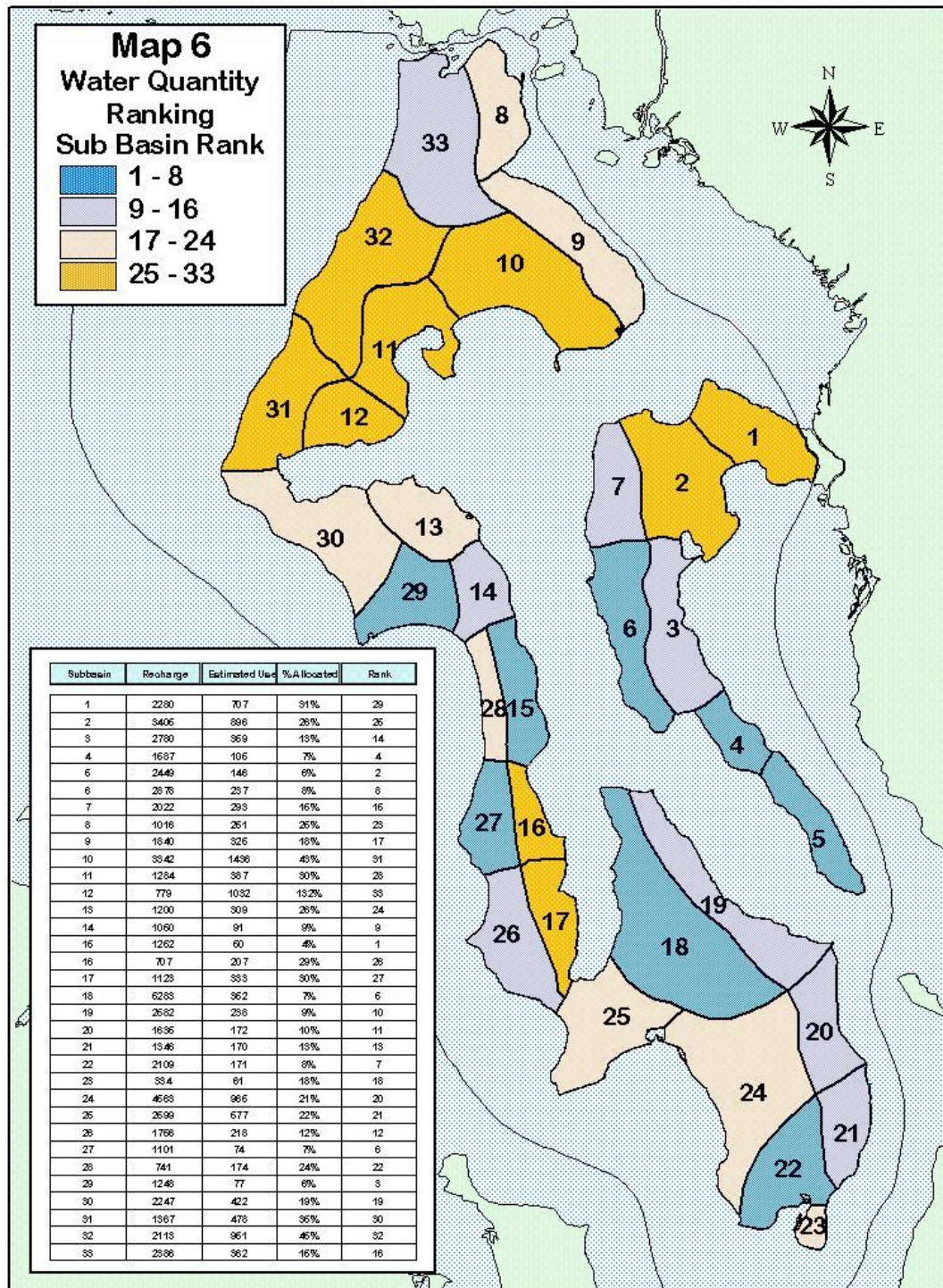
Estimated domestic use – population estimates for each study areas are approximate. In some cases, census blocks overlap study area boundaries. In those cases, the population in the block is assigned to one study area or the other based on the location of the block's center. Also, per capita use estimates are very general. Use can vary widely based on a number of factors including climate, lot size, landscaping, and seasonal occupation.

Estimated other uses – Annual quantities reported in Ecology's water rights database have an uncertain error. People may actually use more or less water than is reported in the database. Also, it is often difficult to separate domestic use from other uses in the water rights database. Some rights are for dual purposes (for example domestic use and agricultural use). Other uses include water rights which likely are predominately uses other than domestic, but some may have a domestic component.

Groundwater recharge – There is a great deal of uncertainty in the recharge estimates. The source of the estimates, The Groundwater Management Plan, used a "middle of the road" (as opposed to conservative) approach for estimating the recharge based on rainfall, evapotranspiration, and run-off. The approach is discussed in detail in section II-6 of the Groundwater Management Plan.

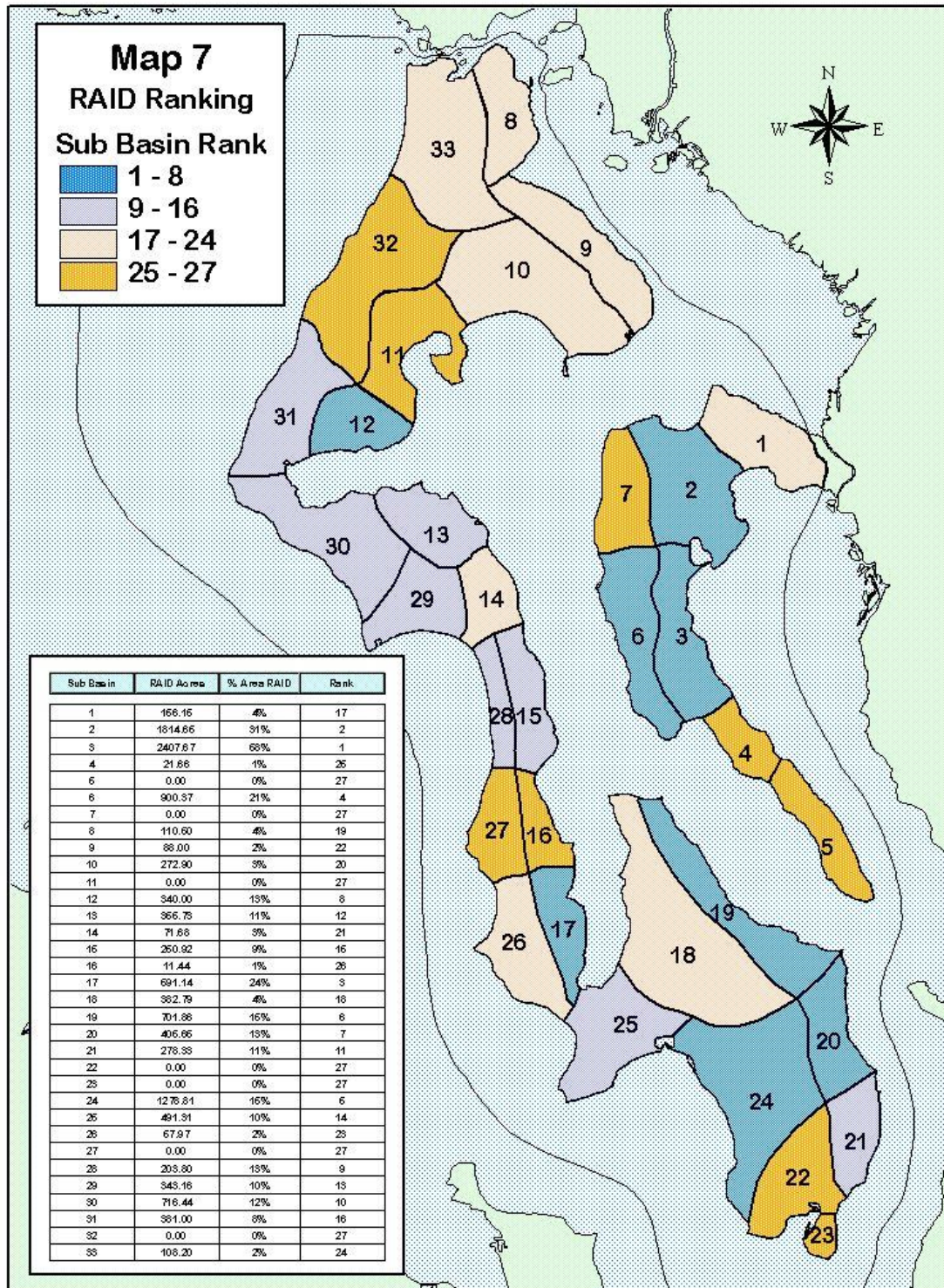
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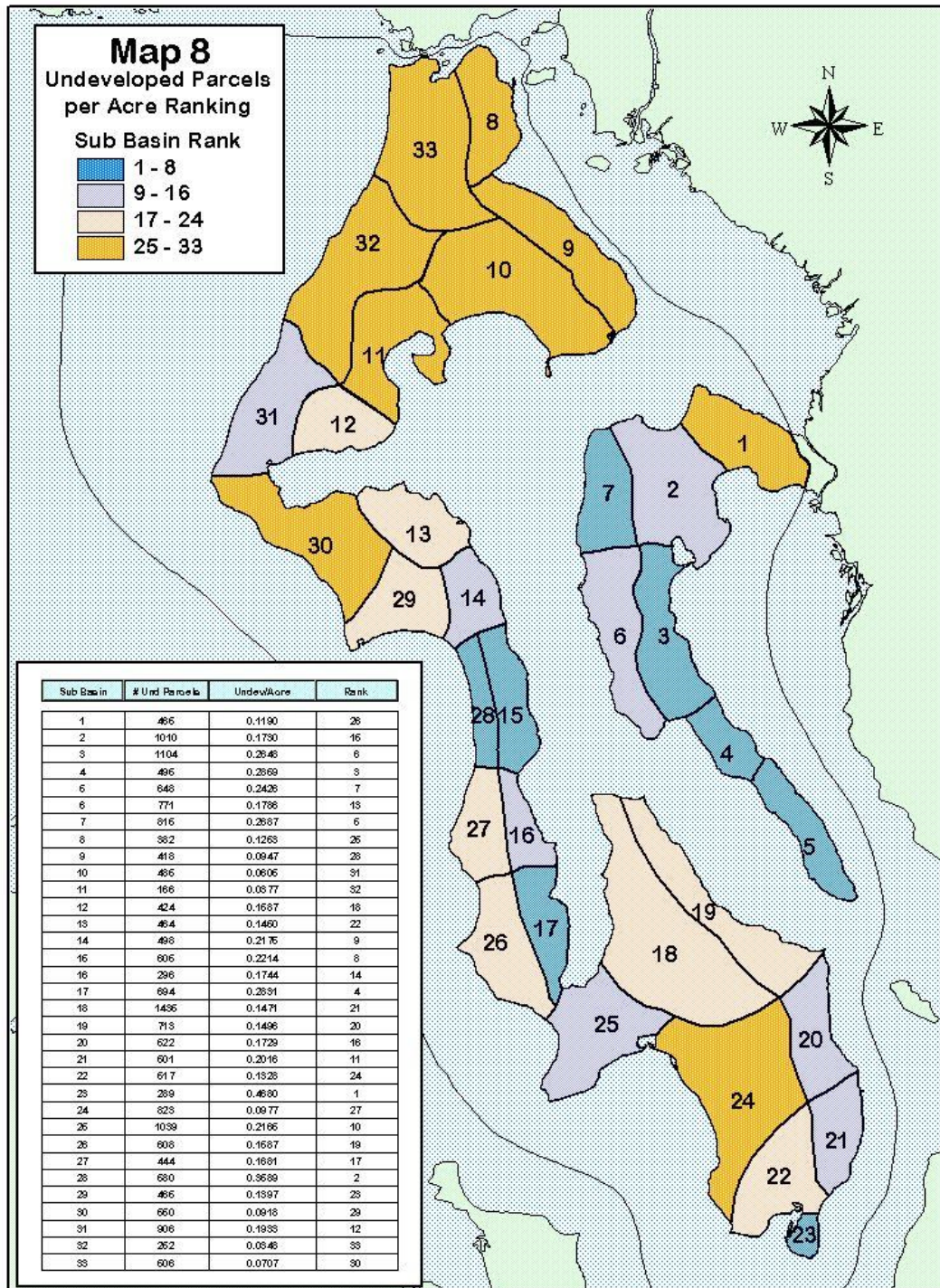
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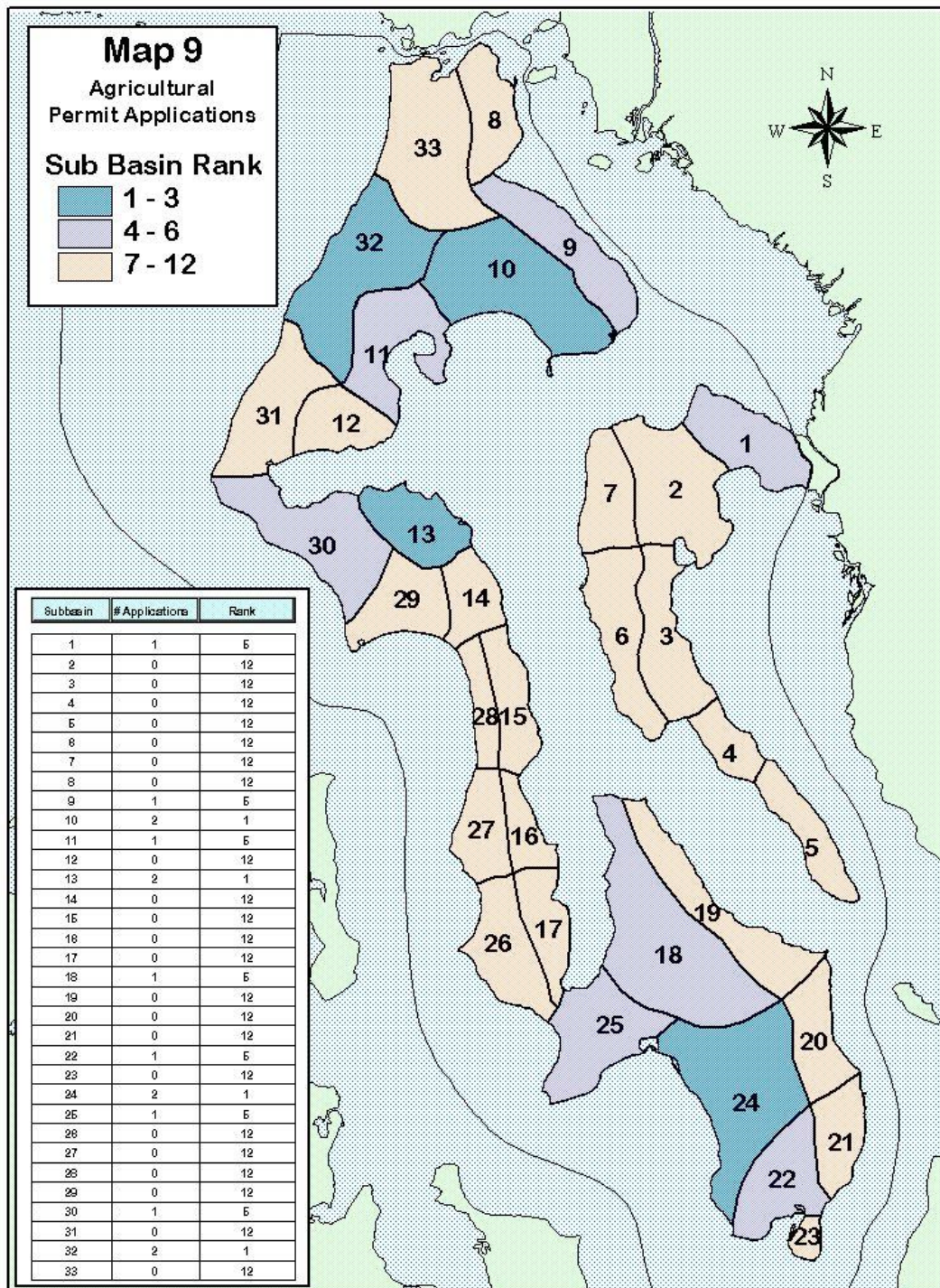
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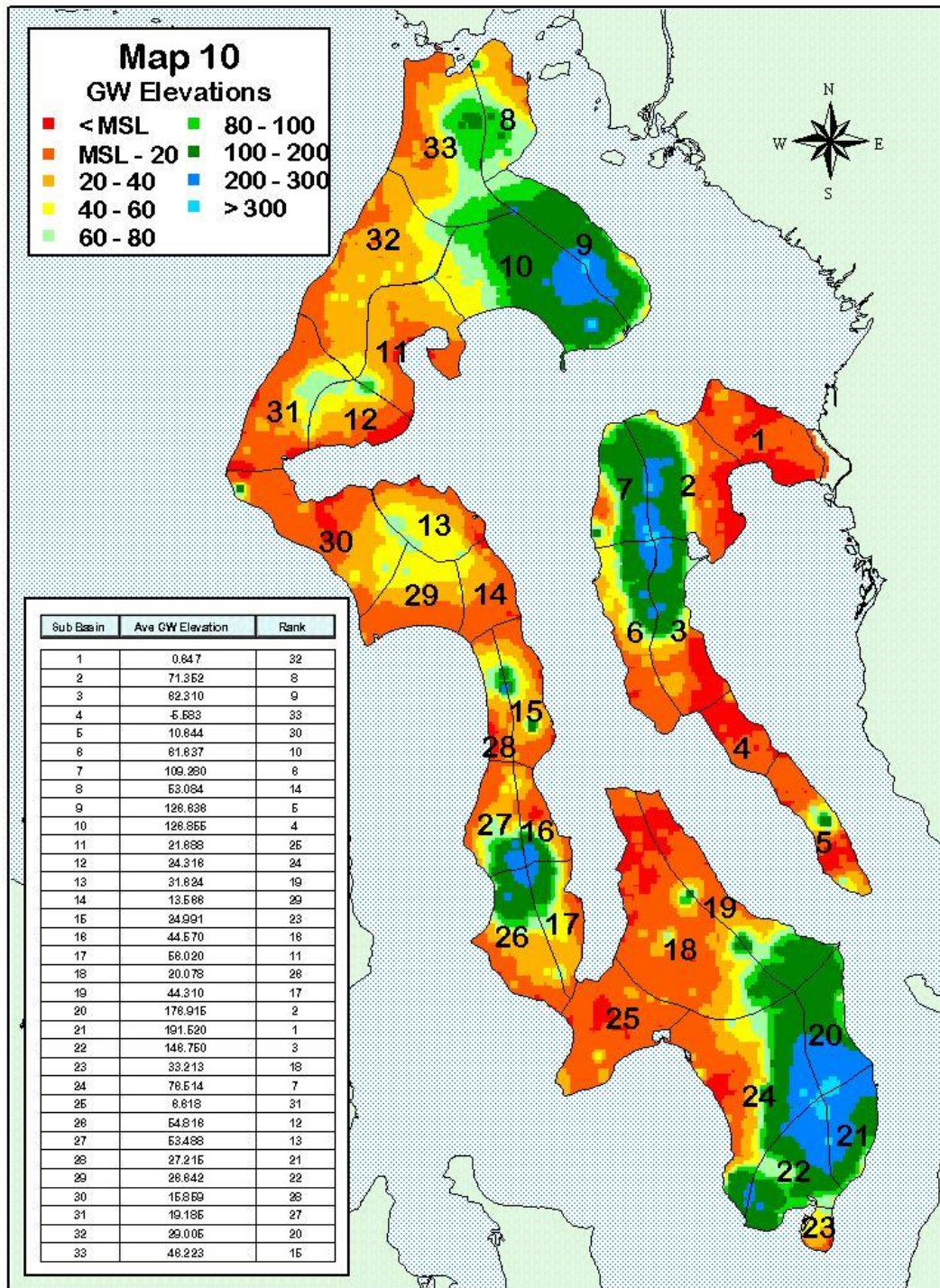
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Land Use

This category is a means of comparing the population growth potential between study areas. Water source development and land development go hand-in-hand. When water rights are not processed in designated growth areas, smaller unregulated water sources must be developed or growth must go elsewhere. This category of analysis identifies areas where growth is targeted in Island County based on three elements of land use planning - designated growth areas, in-fill development, and agricultural land use.

Methodology

Designated Growth Areas – One goal of Island County's Comprehensive plan is to encourage population growth in the Urban Growth Areas of the three cities and in designated Rural Areas of Intensive Development. For each study area, the acres of UGA and RAID are calculated and expressed as a percentage of total Study Area Land. Larger percentages indicate a greater potential to accommodate growth consistent with land use planning (Map 7).

In-fill development – One goal of Island County's comprehensive plan is to accommodate growing population in areas where there is already development and platted lots and infrastructure. For each study area the number of undeveloped platted lots is calculated and expressed as a ratio of undeveloped lots per acre. Study areas with a greater number of undeveloped platted lots per acre have a greater potential to support in-fill development (Map 8).

Agricultural Land Use – One goal of Island County's comprehensive plan is to encourage rural agricultural activities. For each study area, the number of agriculture-related water right applications is calculated. Processing water rights in areas with a greater number of agricultural applications will better serve this land use goal (Map 9).

Limitations

Designated Growth Areas - Urban Growth areas and RAIDs may cross study area boundaries. In those cases, the RAID acres are assigned to the Study area that contains the center of the RAID. Furthermore, RAIDs are variable in the population they can accommodate. RAIDs have varying density limits and varying degrees of buildable and already built land.

In-fill development – Not all undeveloped platted lots can accommodate development. Development potential is also depended on suitability of the land, availability of services, and other factors.

Agricultural Land Use – All study areas have the potential for agricultural of varying types and scales. Thus it is difficult to distinguish between areas based on land use designations. Agricultural water right applications are a means of distinguishing between study areas based on need.

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Seawater Intrusion

The biggest threat to ground water in Island County is seawater intrusion. The potential for seawater intrusion is related to the elevation of the ground water relative to sea level. Other factors such as recharge, pumping rates, aquifer transmissivity, hydraulic gradient, seasonal variation, and the geometry of the aquifer can influence the distribution and magnitude of seawater intrusion. When water is withdrawn from an aquifer in areas close to the shoreline and at rates near to or greater than the rate of freshwater flow in the aquifer, seawater intrusion may occur. This category compares the degree of known and potential seawater intrusion problems between study areas. Areas where there is presently or potentially a seawater intrusion problem should be a lower priority for water rights processing.

Methodology

Two measures of seawater intrusion are used to rank study areas

Chlorides - a grid of chloride levels (Map 5) was estimated based on water quality data from 2938 wells with bottoms at or below 30 feet above sea level. The presence of Chlorides in groundwater is generally an indication of seawater intrusion. From the grid, the average chloride level is calculated for each study area. Study areas with lower average chloride levels have fewer seawater intrusion problems.

Water Level - a grid of water level elevation (Map 10) was estimated using the same data as was used to generate the groundwater elevation contour map (discussed above). The greater the elevation of groundwater above sea level, the lower the likelihood of seawater intrusion. From the grid, the average water level for each study area is calculated. Study areas with higher average water levels have a lower potential for seawater intrusion problems

Limitations

Chlorides often, but may not always, indicate seawater intrusion. Selecting wells screened close to, or below, sea level increases the likelihood that wells with seawater intrusion problems have been selected. However some of the chloride levels may result from factors other than seawater intrusion such as elevated water hardness. Furthermore, The grids used to calculate the average levels for both chlorides and water level contain the same limitations resulting from approximations in groundwater characteristics as are discussed in study area delineation section above.